19. (Amended) An optically active chloromandelic acid crystalline obtained by the method according to claim 1, whose packing density is more than 0.5 g/cm^3.

REMARKS

Claims 1-3, 7-9, 11, and 13-19 are pending in the application, and claims 1 and 19 have been amended as indicated in the attached Appendix. Support for the amendment to claim 1 can be found in the specification, e.g., at page 17, third paragraph, through page 18, fourth paragraph. Claim 19 has been amended to depend from claim 1. Thus, the amendments are fully supported by the specification and add no new matter.

Rejection Under 35 U.S.C. § 112, First Paragraph

The Office rejected claims 1 and 2 under 35 U.S.C. § 112, first paragraph, alleging that the "invention is enabled for some of the hydrocarbon solvents such as chain hydrocarbons containing 5 to 16 carbons, such as 2-methylpentane and 3-methylpentane, saturated monocyclic hydrocarbons containing 6 to 16 carbon atoms, such as methylcyclopentane, and methylcyclohexane, and aromatic hydrocarbons, such as benzene, toluene, trimethylbenzene, o-xylene, m-xylene or an isomeric mixture of xylene, not all the hydrocarbon solvents." Action at page 2, item 2. Solely to expedite prosecution and without acquiescing to the rejection, Applicants have amended claim 1 to recite "a hydrocarbon solvent selected from chain hydrocarbons containing 5 to 16 carbons, saturated monocyclic hydrocarbons containing between 6 and 16 carbon atoms, and aromatic hydrocarbons." Claim 2 depends from claim 1.

In view of the foregoing amendment, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 112, first paragraph.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Rejections Under 35 U.S.C. § 102(b)

The Office rejected claims 1-3, 11, and 13 under 35 U.S.C. § 102(b) for allegedly being anticipated by Shiono et al. (U.S. Patent No. 4,694,090; hereafter "Shiono"). This rejection is virtually a verbatim repeat of the rejection set forth in the Office Action of December 17, 2001, at ¶ 3, to which Applicants had responded in the Amendment and Response of April 17, 2002, at pages 4-5. The rejection does not address any of the arguments set forth in that paper and, consequently, does not advance the prosecution of this case. Moreover, this rejection contravenes the Office's duty to answer the substance of the applicant's argument. Indeed, MPEP 707.07(f) provides that "[w]here an applicant traverses a rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." Accordingly, because Applicants do not know the Office's response to Applicants' prior arguments, Applicants' only recourse is to traverse the present rejection for the reasons set forth in the previous response and reiterated here.

As set forth in MPEP § 2131, to anticipate a claim under 35 U.S.C. § 102, a reference must teach every element of the claim. *See also Transclean Corp. v. Bridgewood Services, Inc.*, 290 F.3d 1364, 1370, 62 USPQ2d 1865, 1869 (Fed. Cir. 2002) (citations omitted)(for a reference to anticipate the claimed invention, the reference must describe the invention such that "each and every limitation is found either expressly or inherently" within it). Because Shiono does not teach all of the elements of the claimed methods of producing α-hydroxycarboxylic acid in the presence of a hydrocarbon solvent, it does not anticipate the present invention.

The Office alleged that "Shiono et al disclose a process of making α-hydroxycarboxylic acid by hydrolyzing a cyanohydrin in the presence of a mineral acid such as a hydrochloric acid

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

and a high boiling alcohol such as glycerol, ethylene glycol (see col. 6, lines 1-11) at room temperature or under heating...." Action at page 3, item 4. The Office further stated that in Shiono "water is added to the reaction mixture and then the whole mixture is extracted with diethyl ether and washed with water, dried; the solvent in the reaction mixture is distilled off, and the residue is then purified by recrystallization...." *Id.*

This disclosure fails to set forth each of the elements of the claimed invention. As now amended, claim 1 recites "[a] method for producing α-hydroxycarboxylic acid, which comprises hydrolyzing cyanohydrin in the presence of a hydrocarbon solvent selected from chain hydrocarbons containing 5 to 16 carbons, saturated monocyclic hydrocarbons containing between 6 and 16 carbon atoms, and aromatic hydrocarbons." The specification defines a hydrocarbon solvent as "an organic compound consisting of carbon atoms and hydrogen atoms only." Specification at page 17. Shiono, in contrast, teaches the use of a "high boiling alcohol such as glycerol, ethylene glycol, methylcellosolve, etc." Shiono at column 6, lines 10-11.

A hydrocarbon solvent is distinctly different from an alcohol solvent in that an alcohol comprises carbon, hydrogen and oxygen, while a hydrocarbon molecule as defined by the specification consists of only carbon and hydrogen. Shiono does not teach a cyanohydrin hydrolyzed in the presence of a hydrocarbon solvent. For at least that reason, Shiono fails to teach every element of claim 1 and, therefore, does not does not anticipate that claim. Claims 2, 3, and 11 depend from claim 1 and are, similarly, not anticipated by Shiono.

Claim 8 recites "[a] method for producing optically active crystallizing α-hydroxycarboxylic acid, which comprises crystallizing optically active α-hydroxycarboxylic acid in an aqueous solution." Claim 9 depends from claim 8. Claim 13 recites "crystallizing optically active α-hydroxycarboxylic acid...in an aqueous solution." Thus, claims 8, 9, and 13 each recite

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

"crystallizing optically active α-hydroxycarboxylic acid...in an aqueous solution." That element is not taught by Shiono.

Specifically, Shiono discusses purifying α-hydroxycarboxylic acid by recrystallization (see, e.g. Shiono at column 6, lines 52-56). The solution used in Shiono, however, is diethyl ether and n-hexane (see, e.g., Shiono at column 25, lines 65-67), rather than "an aqueous solution" as is recited in claims 8, 9, and 13. For at least that reason, Shiono fails to teach every element of claims 8, 9, and 13 and accordingly, it does not anticipate those claims.

Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(b) in view of Shiono.

Rejection under 35 U.S.C. § 103

In another nearly identical rejection from the previous Action, the Office rejected claims 7 and 14-18 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Shiono.

The only additional text in this previously traversed rejection is a reference to Shiono, which the Office alleged teaches a process of hydrolyzing a cyanohydrin "in the presence of methanol, benzene, and toluene (see col. 6, lines 37-39)." Upon review of the reference, however, those lines teach neither a process of hydrolyzing a cyanohydrin, nor the presence of benzene and toluene. As discussed above, Shiono teaches hydrolysis of a cyanohydrin in the presence of high-boiling alcohol to produce α-hydroxycarboxylic acid. *See* Shiono at Col 6, lines 1-12. The cited section describes subsequent reactions involving that α-hydroxycarboxylic acid, after its formation by hydrolysis. Specifically, the text cited by the Office describes a reaction of α-hydroxycarboxylic acid with an alkali metal in the presence of a lower alcohol to

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

generate a corresponding salt. The Office has failed to explain how that reaction bears on the patentability of the present invention.

The Office rejected has also repeated the previous assertion that:

> [w]ith respect to the use of 10 equivalents of mineral acid relative to the cyanohydrin, the reference is silent. However, in the hydrolysis of hydantoin, 1-5 moles of sodium hydroxide are used per mole of hydantoin (see col. 4, lines 33-35). Furthermore, Shiono et al do teach that hydrochloric acid and sodium hydroxide are equivalent to each other in the hydrolysis.

Action at page 6.

Applicants again point out that the hydrolysis of cyanohydrin is not the same as the hydrolysis of hydantoin, and the Office has not suggested to the contrary. Furthermore, acid-catalyzed hydrolysis, such as that catalyzed by a mineral acid selected from hydrochloric acid, sulfuric acid, boracic acid, phosphoric acid and perchloric acid, differs significantly from alkali-catalyzed hydrolysis, such as that catalyzed by sodium hydroxide. For example, it is known in the art that there is high probability of racemization in alkali-catalyzed hydrolysis, as compared with acid-catalyzed hydrolysis.

Claims 7, 17, and 18 recite a method of producing optically active α-hydroxycarboxylic acid with high optical purity by hydrolysis of optically active α-cyanohydrin. To obtain optically active α-hydroxycarboxylic acid with high optical purity, the reaction conditions are controlled. The claimed method can be achieved by hydrolyzing optically active α-cyanohydrin with a mineral acid at a temperature of up to 90°C, using at most 10 equivalents of mineral acid relative to cyanohydrin. When hydrolysis is carried out with more than 10 equivalents of mineral acid, or at a temperature greater than about 90°C, the optical purity or yield of α-hydroxycarboxylic acid may be reduced. *See, e.g.*, specification at Examples 1 and 2 and Table 4.

Shiono does not teach or suggest hydrolyzing optically active α-cyanohydrin at a temperature of 90°C or lower, or in the presence of at most 10 equivalents of mineral acid.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Moreover, Shiono also fails to teach or suggest that such a method may result in a high yield of optically active α-hydroxycarboxylic acid with a high optical purity. Therefore, Applicants assert that Shiono does not render the claimed invention obvious.

Finally, in a newly-made rejection, the Office rejected claim 19 under 35 U.S.C. 103(a), asserting that the invention was unpatentable over Flege et al (US. 4,218,380) which discloses a "3-chloromandelic acid." Action at p. 7. Solely to expedite prosecution and without acquiescing to the rejections, Applicants have amended claim 19 to depend from claim 1. Because claim 1 is patentable for the reasons discussed above, claim 19 is likewise patentable. Thus, the rejection is moot.

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) over Shiono.

CONCLUSION

Applicants respectfully assert that the present application is in condition for allowance and request that the Office issue a timely Notice of Allowance for pending claims 1-3, 7-9, 11, and 13-19. If the Office does not consider the application to be allowable, the undersigned requests that, prior to taking action, the Office call her at (650) 849-6607 to set up an interview.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, L.L.P.

Dated: November 18, 2002

By: Robert W. Mann Reg. No. 48,555 for
Jean B. Fordis
Reg. No. 32,984

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

APPENDIX TO AMENDMENT AND RESPONSE

Version with markings to Show Changes

1. (Amended) A method for producing α-hydroxycarboxylic acid, which comprises hydrolyzing cyanohydrin in the presence of a hydrocarbon solvent selected from chain hydrocarbons containing 5 to 16 carbons, saturated monocyclic hydrocarbons containing between 6 and 16 carbon atoms, and aromatic hydrocarbons.

19. (Amended) An optically active chloromandelic acid crystalline obtained by the method according to claim 1, whose packing density is more than 0.5 g/cm^3.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

three months of the mailing date of that communication. Applicants submit a copy of this communication and the listed documents. U.S. Patent No. 4,945,180 and U.S. Patent Application No. 09/834,926 (Publication No. US2001/0041359) are the U.S. counterparts of EP 0 293 752 and EP 1 148 042, respectively, which are in German. Applicants have included copies of these corresponding U.S. Patent documents, as well.

Applicants respectfully request that Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached form.

This submission does not represent that a search has been made or that no better art exists and does not constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claims in the application and applicants determine that the cited documents do not constitute "prior art" under United States law, applicants reserve the right to present to the Office the relevant facts and law regarding the appropriate status of such documents.

Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents, should one or more of the documents be applied against the claims of the present application.

If there is any fee due in connection with the filing of this Statement, please charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: August 22, 2002

By: _____
Robert W. Mann
Reg. No. 48,555

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com